

AMENDMENTS TO THE CLAIMS:

Applicants propose to amend claims 1, 6, 13 and 18. Upon entry of this Response by the Examiner, this listing of claims will replace all prior versions and listings of claims in the application.

1. (Currently Amended) A method for maintaining a reactor chamber of a chemical vapor deposition system, comprising:

repeating the following until a volume of cleaning gas used during one or more plasma clean cycles has reached a predetermined volume:

depositing one or more layers outwardly from an inner surface of a reactor chamber of a chemical vapor deposition system, the one or more layers forming an accumulation layer;

establishing that the accumulation layer has reached a specified thickness;

performing a plasma clean cycle by introducing the cleaning gas into the reactor chamber; and

calculating the volume of the cleaning gas used during the one or more plasma clean cycles, the volume of the cleaning gas indicating the volume of cleaning gas introduced into the reactor chamber; [[and]]

providing a notification that the volume of the cleaning gas used during the one or more plasma clean cycles has reached the predetermined volume; and

scheduling a chamber maintenance procedure in response to the notification that the volume of the cleaning gas used during the one or more plasma clean cycles has reached the predetermined volume.

2. (Original) The method of Claim 1, wherein depositing the one or more layers outwardly from the inner surface of the reactor chamber comprises repeating the following for one or more semiconductor wafers:

receiving a semiconductor wafer of the one or more semiconductor wafers; and

depositing a layer of the one or more layers on the received semiconductor wafer.

3. (Original) The method of Claim 1, wherein depositing the one or more layers outwardly from the inner surface of the reactor chamber comprises repeating the following until the specified thickness is reached:

receiving a semiconductor wafer of one or more semiconductor wafers;

depositing a layer of the one or more layers on the received semiconductor wafer; and

calculating the thickness of the accumulation layer.

4. (Original) The method of Claim 1, wherein calculating the volume of the cleaning gas used during the one or more plasma clean cycles comprises:

establishing a parameter related to the flow of the cleaning gas according to a mathematical relation;
measuring the parameter during the one or more plasma clean cycles to yield a measurement; and
calculating the volume of the cleaning gas in accordance with the measurement and the mathematical relation.

5. (Original) The method of Claim 1, wherein calculating the volume of the cleaning gas used during the one or more plasma clean cycles comprises:

establishing a volume per time of the flow of the cleaning gas;
measuring the duration of the flow of the cleaning gas during the one or more plasma clean cycles to yield a measurement; and
calculating the volume of the cleaning gas in accordance with the measurement and the volume per time of the flow of the cleaning gas.

6. (Currently Amended) The method of Claim 1, ~~further comprising scheduling a chamber maintenance procedure in response to the notification that the volume of the cleaning gas used during the one or more plasma clean cycles has reached the predetermined volume~~, the maintenance procedure comprising replacing a part of the reaction chamber.

7. (Withdrawn) A chemical vapor deposition system, comprising:

a plasma clean apparatus operable to repeat the following until a volume of cleaning gas used during one or more plasma clean cycles has reached a predetermined volume:

deposit one or more layers outwardly from an inner surface of a reactor chamber of a chemical vapor deposition system, the one or more layers forming an accumulation layer; and

perform a plasma clean cycle by introducing the cleaning gas into the reactor chamber when the accumulation layer has reached a specified thickness; and

a processor coupled to the plasma clean apparatus and operable to:

calculate the volume of the cleaning gas used during the one or more plasma clean cycles, the volume of the cleaning gas indicating the volume of cleaning gas introduced into the reactor chamber; and

provide a notification that the volume of the cleaning gas used during the one or more plasma clean cycles has reached the predetermined volume.

8. (Withdrawn) The system of Claim 7, wherein the plasma clean apparatus is operable to deposit the one or more layers outwardly from the inner surface of the reactor chamber by repeating the following for one or more semiconductor wafers:

receiving a semiconductor wafer of the one or more semiconductor wafers; and

depositing a layer of the one or more layers on the received
semiconductor wafer.

9. (Withdrawn) The system of Claim 7, wherein the plasma clean apparatus
is operable to deposit the one or more layers outwardly from the inner surface of the
reactor chamber by repeating the following until the specified thickness is reached:

receiving a semiconductor wafer of one or more semiconductor wafers;
depositing a layer of the one or more layers on the received
semiconductor wafer; and
calculating the thickness of the accumulation layer.

10. (Withdrawn) The system of Claim 7, wherein the processor is operable to
calculate the volume of the cleaning gas used during the one or more plasma clean
cycles by:

establishing a parameter related to the flow of the cleaning gas according
to a mathematical relation;
measuring the parameter during the one or more plasma clean cycles to
yield a measurement; and
calculating the volume of the cleaning gas in accordance with the
measurement and the mathematical relation.

11. (Withdrawn) The system of Claim 7, wherein the processor is operable to calculate the volume of the cleaning gas used during the one or more plasma clean cycles by:

establishing a volume per time of the flow of the cleaning gas;

measuring the duration of the flow of the cleaning gas during the one or more plasma clean cycles to yield a measurement; and

calculating the volume of the cleaning gas in accordance with the measurement and the volume per time of the flow of the cleaning gas.

12. (Withdrawn) The system of Claim 7, wherein the processor is further operable to schedule a chamber maintenance procedure in response to the notification that the volume of the cleaning gas used during the one or more plasma clean cycles has reached the predetermined volume.

13. (Currently Amended) Software for maintaining a reactor chamber of a chemical vapor deposition system, the software embodied in software and operable to:

repeat the following until a volume of cleaning gas used during one or more plasma clean cycles has reached a predetermined volume:

deposit one or more layers outwardly from an inner surface of a reactor chamber of a chemical vapor deposition system, the one or more layers forming an accumulation layer;

establish that the accumulation layer has reached a specified thickness;

perform a plasma clean cycle by introducing the cleaning gas into the reactor chamber; and

calculate the volume of the cleaning gas used during the one or more plasma clean cycles, the volume of the cleaning gas indicating the volume of cleaning gas introduced into the reactor chamber; [[and]]

provide a notification that the volume of the cleaning gas used during the one or more plasma clean cycles has reached the predetermined volume; and
schedule a chamber maintenance procedure in response to the
notification that the volume of the cleaning gas used during the one or more
plasma clean cycles has reached the predetermined volume.

14. (Original) The software of Claim 13, operable to deposit the one or more layers outwardly from the inner surface of the reactor chamber by repeating the following for one or more semiconductor wafers:

receiving a semiconductor wafer of the one or more semiconductor wafers; and

depositing a layer of the one or more layers on the received semiconductor wafer.

15. (Original) The software of Claim 13, operable to deposit the one or more layers outwardly from the inner surface of the reactor chamber by repeating the following until the specified thickness is reached:

receiving a semiconductor wafer of one or more semiconductor wafers;

depositing a layer of the one or more layers on the received
semiconductor wafer; and
calculating the thickness of the accumulation layer.

16. (Original) The software of Claim 13, operable to calculate the volume of
the cleaning gas used during the one or more plasma clean cycles by:
establishing a parameter related to the flow of the cleaning gas according
to a mathematical relation;
measuring the parameter during the one or more plasma clean cycles to
yield a measurement; and
calculating the volume of the cleaning gas in accordance with the
measurement and the mathematical relation.

17. (Original) The software of Claim 13, operable to calculate the volume of
the cleaning gas used during the one or more plasma clean cycles by:
establishing a volume per time of the flow of the cleaning gas;
measuring the duration of the flow of the cleaning gas during the one or
more plasma clean cycles to yield a measurement; and
calculating the volume of the cleaning gas in accordance with the
measurement and the volume per time of the flow of the cleaning gas.

18. (Currently Amended) The software of Claim 13, further operable to
~~schedule the chamber maintenance procedure in response to the notification that the~~

~~volume of the cleaning gas used during the one or more plasma clean cycles has~~
~~reached the predetermined volume,~~ the maintenance procedure comprising replacing a
part of the reaction chamber.

19. (Withdrawn) A system for maintaining a reactor chamber of a chemical
vapor deposition system, comprising:

means for repeating the following until a volume of cleaning gas used
during one or more plasma clean cycles has reached a predetermined volume:

depositing one or more layers outwardly from an inner surface of a
reactor chamber of a chemical vapor deposition system, the one or more layers
forming an accumulation layer;

establishing that the accumulation layer has reached a specified
thickness;

performing a plasma clean cycle by introducing the cleaning gas
into the reactor chamber; and

calculating the volume of the cleaning gas used during the one or
more plasma clean cycles, the volume of the cleaning gas indicating the volume
of cleaning gas introduced into the reactor chamber; and

means for providing a notification that the volume of the cleaning gas used
during the one or more plasma clean cycles has reached the predetermined
volume.

20. (Previously Presented) A method for maintaining a reactor chamber of a chemical vapor deposition system, comprising:

repeating the following until a volume of cleaning gas used during one or more plasma clean cycles has reached a predetermined volume:

depositing one or more layers outwardly from an inner surface of a reactor chamber of a chemical vapor deposition system, the one or more layers forming an accumulation layer, by:

repeating the following for one or more semiconductor wafers: receiving a semiconductor wafer of the one or more semiconductor wafers, and depositing a layer of the one or more layers on the received semiconductor wafer; and

repeating the following until the specified thickness is reached: receiving a semiconductor wafer of the one or more semiconductor wafers, depositing a layer of the one or more layers on the received semiconductor wafer, and calculating the thickness of the accumulation layer;

establishing that the accumulation layer has reached a specified thickness;

performing a plasma clean cycle by introducing the cleaning gas into the reactor chamber; and

calculating the volume of the cleaning gas used during the one or more plasma clean cycles, the volume of the cleaning gas indicating the volume of cleaning gas introduced into the reactor chamber, by:

establishing a parameter related to the flow of the cleaning gas according to a mathematical relation, measuring the parameter during the one or more plasma clean cycles to yield a measurement, and calculating the volume of the cleaning gas in accordance with the measurement and the mathematical relation;

establishing a volume per time of the flow of the cleaning gas, measuring the duration of the flow of the cleaning gas during the one or more plasma clean cycles to yield a time measurement, and calculating the volume of the cleaning gas in accordance with the time measurement and the volume per time of the flow of the cleaning gas;

providing a notification that the volume of the cleaning gas used during the one or more plasma clean cycles has reached the predetermined volume; and scheduling the chamber maintenance procedure in response to the notification that the volume of the cleaning gas used during the one or more plasma clean cycles has reached the predetermined volume, the maintenance procedure comprising replacing a part of the reaction chamber.